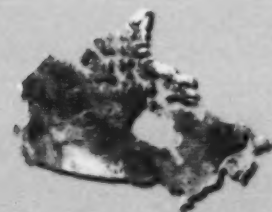




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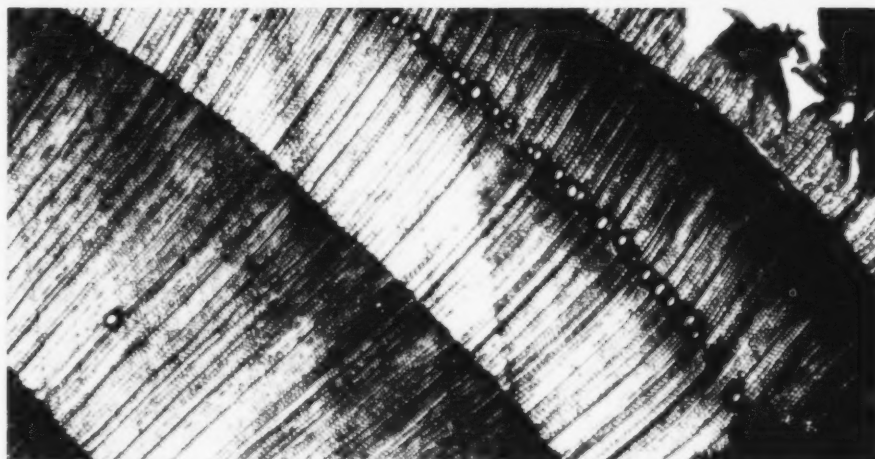
National Forest Pest Strategy: harmonizing and collaborating on pest management across Canada

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April 2008
ISSN 0706-9413

Canada

Dates of root infection used to establish impact



Traumatic resin canal barriers form beneath a tree's cambium layer in response to fungus infection. By tracing the canal positions preserved within tree rings to nearby lesions, researchers can determine when past infection events occurred.

In order to measure a disease's impact on a tree, you need to know when it became infected. This is difficult to do with root diseases: infection and disease progression occur underground, and above-ground symptoms may not show until years later, if ever. As well, root diseases progress through a stand with time of infections varying between trees.

Natural Resources Canada Root Diseases Research Scientist Mike Cruickshank (mcruicks@nrcan-rncan.gc.ca) recently determined how to date infections by root-rot fungus *Armillaria ostoyae* years after they occur.

His method traces a defense mechanism that occurs in most trees. When a tree is wounded or stressed, ducts called traumatic resin canals form under the tree's cambium and around the affected tissue. If enough develop, the

canals create a physical barrier between affected and healthy tissues. The barrier helps contain the infection.

The canals are preserved within the annual rings of root wood, which is how Cruickshank is able to trace them across the rings to specific fungus-caused lesions.

"Traumatic resin canals allow us to create a profile of infection events over

time," he says. If attacked once, a tree may contain an infection with canals, but the fungus may grow around the edges of the resin barrier and attack the roots elsewhere. "Being able to date infection events by year means we can go back and determine impacts of that particular infection—on growth and production in the tree, as well as subsequent effects in the stand."

Knowing root disease impact would enable forest managers to more accurately predict future timber supply from high-risk stands, as well as to assess broader economic, silviculture, and climate change impacts.

Root diseases exist in most forests, but are especially common in tree plantations, particularly those where stumps of previously harvested trees are left in place before replanting.

Armillaria attacks the roots of all trees and many shrub and herb species native to British Columbia, but causes greatest mortality among Douglas-fir trees planted in the province's interior. The fungus is prevalent across Canada and the northern hemisphere.

Tool supports decision making

Laminated root rot can reduce productivity in British Columbia's coastal Douglas-fir stands by as much as 40 to 70 percent, says Natural Resources Canada Forest Pathology Research Scientist Rona Sturrock. "It's the root disease of Douglas-fir on the west coast, and there's lots of it out there."

The disease, caused by the fungus *Phellinus sulphurascens* (also known as *P. weirii*), is a fact of forest life on the coast where harvest and silviculture plans for Douglas-fir stands frequently must account for the fungus and its effects.

To help forest managers make those plans, Sturrock (rsturrock@nrcan-rncan.gc.ca) and colleagues from the British Columbia Ministry of Forests and FORREX (Forest Research Extension Partnership) teamed up to produce *British Columbia's Coastal Forests Laminated Root Rot Forest Health Stand Establishment Decision Aid*. The two-page reference tool condenses disease and host biology, harvesting and silviculture considerations, and other relevant information into an easy-to-use format.

It is one in a series of stand establishment decision aids (SEDAs) published by FORREX to provide information on factors that limit or slow establishment of new forest stands.

"The silviculture community told us they needed easily accessible information on site-limiting factors," says FORREX Extension Services/Early Stand Dynamics Corporate Team Leader Kathie Swift. Each decision aid covers a subject identified as a regional silviculture priority and fits into the framework of the British Columbia Forests and Range Practices Act.

Sturrock is now working with provincial colleagues to study laminated root rot in drier, interior Douglas-fir forests. The results will be synthesized into another FORREX decision aid for those forest ecosystems.

Sources

"Traumatic resin canals as markers of infection events in Douglas-fir roots infected with *Armillaria* root disease" appeared in the journal *Forest Pathology*.

"British Columbia's Coastal Forests Laminated Root Rot Forest Health Stand Establishment Decision Aid" is published in the *BC Journal of Ecosystems and Management*.

Both papers can be downloaded from the Canadian Forest Service online bookstore.

Clearcutting and nitrogen in the montane forest

One concern about clearcutting is its effect on nitrogen-cycling processes and how it can lead to unfavourable forest regeneration because of reduced nutrient availability. But to what extent are the transitional montane and montane forests of Vancouver Island, British Columbia, affected?

Recent research indicates the impact may be less than expected.

Since 1992, in an area near Campbell River, 21 integrated research studies have compared four silviculture treatments with an unharvested, old-growth area. Known as the Montane Alternative Silviculture Systems (MASS) project, a number of the studies focus on nitrogen cycling. Canadian Forest Service Research Scientist Brian Titus synthesized the studies and came to an unexpected conclusion.

"One of the concerns about clearcutting is that it may lead to reduced nitrogen availability or depletion, not just through removal of stems, but through increased nitrogen cycling and increased leaching at the site," says Titus (btitus@nrcan-rncan.gc.ca). "Studies in some parts of the world have shown that clearcutting in coniferous forests creates the production of ammonium, which is then converted to nitrate nitrogen, which is then easily leached away from the site, taking other nutrients with it."

According to Titus, most nitrate found among all the silviculture treatments at MASS appears to be produced directly from organic matter. "That is, it didn't go through an ammonium-to-nitrate conversion. This is probably why, to our surprise, we didn't find large amounts of nitrate after clearcutting at MASS."

Some international studies have shown that nitrate nitrogen is easily leached from the forest. If present after harvesting, there's a possibility that nitrate will be washed away with rainfall. However, the MASS site has predominately ammonium nitrogen, which leaches less readily.

Furthermore, when he used a simple nutrient budget approach, Titus found all the soil nitrogen at MASS could be accounted for by the same kind of disturbances and nitrogen build-up that have occurred since glaciation about 10,000 years ago. In other words, the effect of harvesting on nitrogen capital in the soil in all the silviculture systems at MASS, even the clearcut system, was so small that the nitrogen appeared to have experienced little disturbance at all.

"One might have thought that a transitional montane site would be somewhat fragile in terms of nitrogen retention, but it appears to not be so,"

says Titus. "It seems to be a very robust ecosystem compared to some other forests types. Even clearcutting did not cause the nitrogen leaching one would've expected. And with whatever small amount was detected, levels stabilized after only a few years, with no difference among the silviculture systems."

There may be many reasons not to clearcut in transitional montane forests, Titus says, but concerns about nitrate production, nitrogen leaching, and loss of nitrogen capital don't seem to be warranted. Whether these results would hold true in other coastal forests is unknown.

"The trends and consistency in nitrogen cycling processes found at MASS suggest that results could apply to similar forests in the Pacific Northwest," he says. He points out that transferring results from one area to another is risky. "All the factors within a particular area need to be considered. This research is the result of studies specific to this region and ecosystem."

Source

"Post-harvest nitrogen cycling in clearcut and alternative silviculture systems in a montane forest in coastal British Columbia" appeared in the *Forestry Chronicle*. A copy can be obtained from the Canadian Forest Service online bookstore.

Analysis of studies of soil sampled from different silviculture treatment sites on Vancouver Island led to unexpected results about nitrogen cycling in coastal montane forests.



Beetle research looks to mitigate community risk

Source

Information on research programs and their publications under the federal Mountain Pine Beetle Program are available at <http://mpb.cfs.nrcan.gc.ca>.

Projections of the current mountain pine beetle epidemic in British Columbia show it will kill 80 percent of the province's lodgepole pine resource by 2013. Lodgepole pine is the province's most abundant commercial tree species; harvesting and salvage logging were increased in 2004 to maximize recovery of the beetle-affected wood. However, in 10 to 15 years, the supply of affected pine that remains usable for conventional forest product manufacturing will end. Supply pressures will follow.

The effects will be felt for decades, particularly in communities within infested areas, says Natural Resources Canada Forest Economist Brad Stennes. "Forest-dependent communities that rely on a lodgepole pine timber supply will be most at risk."

A significant portion of the federal government's \$100-million forestry component of the Canada-British Columbia Mountain Pine Beetle Program is designed to help mitigate the epidemic's long-term effects to communities in the beetle-infestation area. Two approaches have been identified.

One focuses on creating opportunities that generate long-term viability of communities. Diversification of their economic bases would soften the economic blow of the inevitable decrease in lodgepole pine availability. For instance, funds to encourage energy and

mineral resource surveys and exploration in the infestation area are being invested to diversify local economies.

The other approach is directed at recovering as much economic value as possible from beetle-killed wood and forests. This strategy is being managed by Natural Resources Canada, through the Canadian Forest Service. Projects funded are examining how existing mill operations might be adjusted to best process beetle-affected wood. If this wood has been on the landscape for a few years before salvage, it has different qualities than healthy wood. This affects the wood's manufacturing shelf life and how it may be processed.

Under this suite of research projects, Stennes (bstennes@nrcan-nrcan.gc.ca) and his colleagues at the Canadian Forest Service are analyzing British Columbia's fibre-transportation networks to determine how changes in volume and quality of fibre over time can be efficiently and cost-effectively used in the forest industry's existing capital structure. This includes how pine-dominated fibre increases are allocated across regions in the near term, and where the capital stock will be located to process decreasing volumes with higher proportions of non-pine fibre in the longer term.

The economists have also examined alternative uses for fibre resulting from the beetle outbreak, including creating energy directly from wood or turning it into bio-energy products such as fuel pellets. In addition, a recent survey of secondary wood manufacturing in British Columbia provides further insight into alternative products, such as log homes, furniture, moulding, and flooring.

"Some of these areas of value-added manufacturing provide high levels of employment per unit of output," says Stennes, "especially compared to sawmills, which in an effort to remain competitive have been becoming increasingly efficient operationally in recent years, and would actually have been laying people off if there hadn't been this increase in annual allowable cut because of mountain pine beetle. And some of these alternative products might actually benefit from characteristics of insect-killed timber."

Researchers are examining opportunities for alternative uses of fibre from mountain pine beetle-killed trees to maximize value recovery and minimize risk to communities in British Columbia's infested areas.

Photo: © Lisa Kyle Young, iStock (1450208)



Report examines boreal economic contributions

During the last decade, discussions on the state of Canada's boreal forests have become more and more commonplace, even outside the country. The country's boreal forest frequently comes up in international discussions regarding climate change, biodiversity and fresh water resources. The federal government and many other Canadian organizations have published reports about it, and articles featuring the boreal region appear in newspapers and magazines around the world on a regular basis.

Attention has focused mostly on the region's ecological resources and their value to global systems. However, according to Natural Resources Canada, Canadian Forest Service Director of Industry, Trade and Economics Bill Wilson, the contributions of Canada's boreal region to local, regional and national economies, communities and values are less well understood.

"Given the vast expanse and disturbances in the Canadian boreal region, the number of Canadians that rely on it directly or indirectly, and the increasing threats to its integrity—including climate change and resource extraction—the Canadian Forest Service saw a need to develop a more comprehensive approach to address those threats. The approach includes improving our understanding of the region's economic and social importance."

Canada's Boreal Forest Economy: economic and socio-economic issues and research opportunities, an overview report released this spring by the Canadian Forest Service, surveys what we know about these issues as they relate to the country's boreal forest resources, and identifies gaps in our knowledge and opportunities to meet challenges to competitiveness and sustainability of the Canadian boreal forest sector.

"The boreal is often portrayed as if it were one single geographic entity," says the report's author,



From small economic ventures like selective logging to industrial-sized panel-board processing plants, Canada's boreal forest contributes significantly to the country's economies and communities.

photos: Phil Burton, Canadian Forest Service

Sources

Canada's Boreal Forest Economy: economic and socio-economic issues and research opportunities can be ordered or downloaded from the Canadian Forest Service online bookstore.

Canadian Forest Service Research Economist Bryan Bogdanski (bbogdans@nrcan-rncan.gc.ca). "But, in reality, what we call 'The Boreal' is very heterogeneous. It is widespread and covers many geographic and ecological regions. It includes many different natural, ecological and cultural resources, and is home to many different kinds of communities."

To gather information for the report, Bogdanski searched the scientific literature, as well as government and industry reports and statistical sources. Some data were easily accessible; some were assembled or hidden in ways that required extensive additional investigation, or were rolled up in other information that obscured them.

"A lot of information about the boreal region in Canada exists," he says, "but it's disparate, it's spread all over the place, it's not easily accessible, sometimes it's inconsistent and not cohesively assembled."

"Improved information and better access to this information will serve to improve the decisions we as a society and as governments make about the boreal," says Wilson (bwilson@nrcan.gc.ca).

Bogdanski says the biggest challenge facing the country's boreal region and the economies that rely on it in the coming years is, "How to sustain the economic benefits accruing from the boreal, without sacrificing the environmental and cultural values that exist across this vast resource and that we all depend on? One of the things that quickly became clear as I gathered the information was that all the information and the information sources need to be better integrated to support better decision making in resource management."

The boreal forest zone is the most extensive terrestrial biome in the world, accounting for 32 percent of the world's forest cover. About one-third of it is found within Canada, sweeping across the country from Newfoundland through northeastern British Columbia into the Yukon Territories. Canada's boreal region covers 545 million hectares, and comprises three-quarters of the country's forests and woodlands, almost 70 percent of its freshwater, one-fifth of its agricultural land, and almost a tenth of its urban areas.

Challenges and opportunities for Canada's boreal region

Canada's Boreal Forest Economy: economic and socio-economic issues and research opportunities identifies a number of opportunities to meet challenges to Canada's boreal forest region and to ensure a competitive and sustainable boreal forest sector:

- Organization of the land base to minimize timber costs while enhancing non-timber values and taking into account the potential impacts of climate change and forest health issues and maximizing synergies between non-forest sectors;
- Development of new and innovative tenure arrangements and property right regimes that support a sustainable and competitive boreal forest sector;
- Improved decision support tools and systems that will enhance the effectiveness and efficiency of forest investments in forest renewal and protection;
- Development of non-timber goods and services, including enhanced use of biomass for energy;
- Development of secondary wood and paper manufacturing;
- Development of new markets;
- Development of new technologies in harvesting, transportation and processing;
- Redesign of policies, such as transportation, energy, and environment that support a sustainable balance between economic, environmental, and social goals.

Strategy provides framework for pest collaboration

In 2005–2006, Canada's federal and provincial governments spent approximately \$140 million on pest management in Canada's forests.

Of that, Pacific Forestry Centre Director General Sue Farlinger, of Natural Resources Canada, Canadian Forest Service, says "more than half was spent on responding to pest problems."

The figures were determined when members of the Canadian Council of Forest Ministers took stock last year of how forest pest management expertise and resources are distributed across the country and across agencies, and who is doing what in terms of management of insects and diseases that affect the country's forests and woodlands. The council, which includes all provincial, territorial and federal ministers responsible for forests in Canada, recently approved a national strategy for dealing with forest pests.

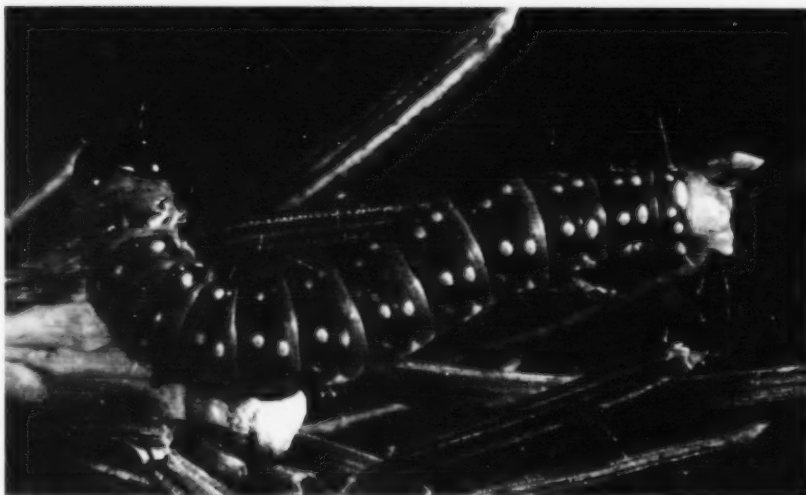
"We've developed a common framework for making decisions about and dealing with forest pests that will be recognized by all jurisdictions in Canada responsible for forest and forest-pest management," says Pacific Forestry Centre Resources Director Jim Wood, who is overseeing implementation of the National Forest Pest Strategy. "It's based on Environment Canada's National Pest Framework: they're looking at all pests across the board—agricultural pests, aquatic pests, invasive pests, native pests.... We've adapted that framework to forest pests."

The stock taking looked at how pest monitoring, risk assessment, hazards scoping, communication with stakeholders in other provinces, and other aspects of forest pest management are done across the country, and helped establish the principles and purpose of the National Forest Pest Strategy: coordination, collaboration, and information sharing between jurisdictions.

The resulting strategy is a standardized, risk-based decision-making framework that ensures proactive, integrated response to the increasing threat of forest pests, using an ecosystem-based approach.

For a Canada-wide strategy for forest pest management to be effective, it must balance the sometimes conflicting contributions of pests to forest environments, communities and economies, and take into account the complex, multi-jurisdictional realities of how forests are managed in Canada.

Forest pests cause significant damage to resources and property across the country. The ecological and economic consequences of

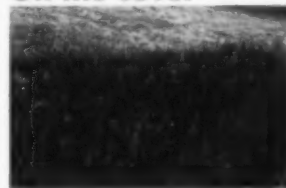


Spruce budworm, a conifer defoliator, drives forest regeneration and other ecosystem processes throughout Canada's boreal forest. It may become a subject of country-wide pest risk analysis for the boreal region under Canada's new National Forest Pest Strategy.

pest outbreaks to forests, forest industries and forest-dependent communities include losses of hundreds of millions of dollars every year and damage to millions of hectares of commercial and non-commercial forests. At the same time, natural, large-scale disturbances are necessary to the continued ecological integrity of Canada's forests. Some forest pests are integral components in ecosystem processes, and altering the dynamics within those processes can lead to unanticipated and costly consequences. The current mountain pine beetle epidemic in British Columbia is an example: nearly a century of wildfire suppression and a more recent focus on managing stands for commercial harvest in the province's interior set the stage for the ecologically and economically devastating beetle outbreak.

The division of roles and responsibilities for forests and forest management across the country further complicates development of a Canada-wide forest pest management strategy. Many different collaborators and jurisdictions must be involved if such a strategy is to succeed. For example, the Canadian Food Inspection Agency is responsible for monitoring and dealing with invasive, non-native pests; the provinces are responsible for dealing with established or native pests. National parks deal with pest problems on their lands, as do First Nations on theirs. The Canadian Forest Service doesn't manage pests directly at all, but has some of the country's greatest expertise to develop pest management tools and coordinate forest pest issues at a national level.

On the cover



The National Forest Pest Strategy coordinates how forest pests of national significance are dealt with across Canada. It addresses both native pests, such as mountain pine beetle, which has expanded its range into forests east of the Rocky Mountains in recent years (above, near Fort St. John, British Columbia), and non-native pests.



Damage caused by gypsy moth, *Lymantria dispar*, can be seen in deciduous and mixed-wood forests, as well as urban forests, throughout eastern Canada.

"The National Forest Pest Strategy requires a lot of participation from across the country," says Canadian Forest Service Insect Ecologist Vince Nealis (vnealis@nrcan-rncan.gc.ca), who provided scientific support during the strategy's development and worked closely with pest management colleagues in the provinces during the development. "It quickly became clear early in my discussions with provincial pest managers that everybody recognizes there's room for improvement in the way we all do business."

The current mountain pine beetle epidemic in British Columbia's mature pine forests showed British Columbia Ministry of Forests and Range Forest Health Project Specialist Tim Ebata firsthand how a regional pest issue can mushroom into a multi-jurisdictional issue. Ebata and his colleagues have contributed to the strategy's development from its earliest brainstorming days, in 2005.

"There is a real need for national coordination on forest pest issues," says Ebata, "Insects and diseases don't recognize provincial boundaries, as we've seen with mountain pine beetle. It's

important that we have a mechanism in place to deal with things at the national level that no one jurisdiction can deal with on their own."

Consistent application of policy and harmonization of practices across the country are also required, he says. In particular, the stock taking initiative "really made clear the great variability between jurisdictions in monitoring, surveying, data collection and storage, and diagnostics."

Saskatchewan Ministry of Environment Provincial Forest Entomologist and Pathologist Rory McIntosh also cites a need for harmonized pest management activities and initiatives across jurisdictions. McIntosh took part in the Canadian Council of Forest Ministers' forest pest management stock taking, and is contributing at a number of levels to determining how the National Forest Pest Strategy should best be implemented across the country.

He believes the strategy will help formalize collaboration among jurisdictions. "It provides an avenue for building and sharing capacity to fill gaps and weaknesses in some areas." For instance, he says, Saskatchewan has been developing its own forest pest strategy. During that process, he and his colleagues identified an insufficient capacity for diagnostics—identifying pests and diseases—within the province. "If it takes two years to determine what pest we're dealing with and whether it's a problem, it may already have become established." Being able to draw on expertise in other jurisdictions while the province builds up its own capacity would decrease critical lag time.

As demonstrated by the stock-taking exercise, the ingredients necessary for a comprehensive, model pest management approach are distributed unevenly across the country.

"Everyone now recognizes that the expertise they need to manage pests better doesn't necessarily reside in their jurisdiction," says Farlinger, who led Canadian Forest Service involvement in the strategy's development prior to her April, 2008, departure from Natural Resources Canada. "The National Forest Pest Strategy is trying to make it easier for this capacity to be brought to bear quickly and effectively on pest problems as they arise, no matter where in Canada that might happen."

By providing a framework for coordinating and harmonizing pest information and management efforts, the strategy encourages efficient sharing of expertise to everyone's benefit.

It also addresses Canada's pest management demographics. Many pest managers in Canada today have 25-plus years of experience, and are due to retire within the next decade or so.

A coordinated approach to information sharing would help retain that collective knowledge in the pest management community.

But the biggest benefit of having a national framework is it "brings this diverse group of scientists and jurisdictions together with a common language, understanding and approach for pest management issues," says Farlinger. "There is a huge 0-to-50 gain just in everybody operating with the same information, and talking to each other, and creating a formal structure for doing that."

A key component of the new strategy is a formalized, standardized risk analysis framework that includes risk assessment, risk management or response, and risk communication. Risk assessment uses scientific evidence to estimate the level of risk based on a combination of both the likelihood and consequences of potential harm. Risk response evaluates those risks that

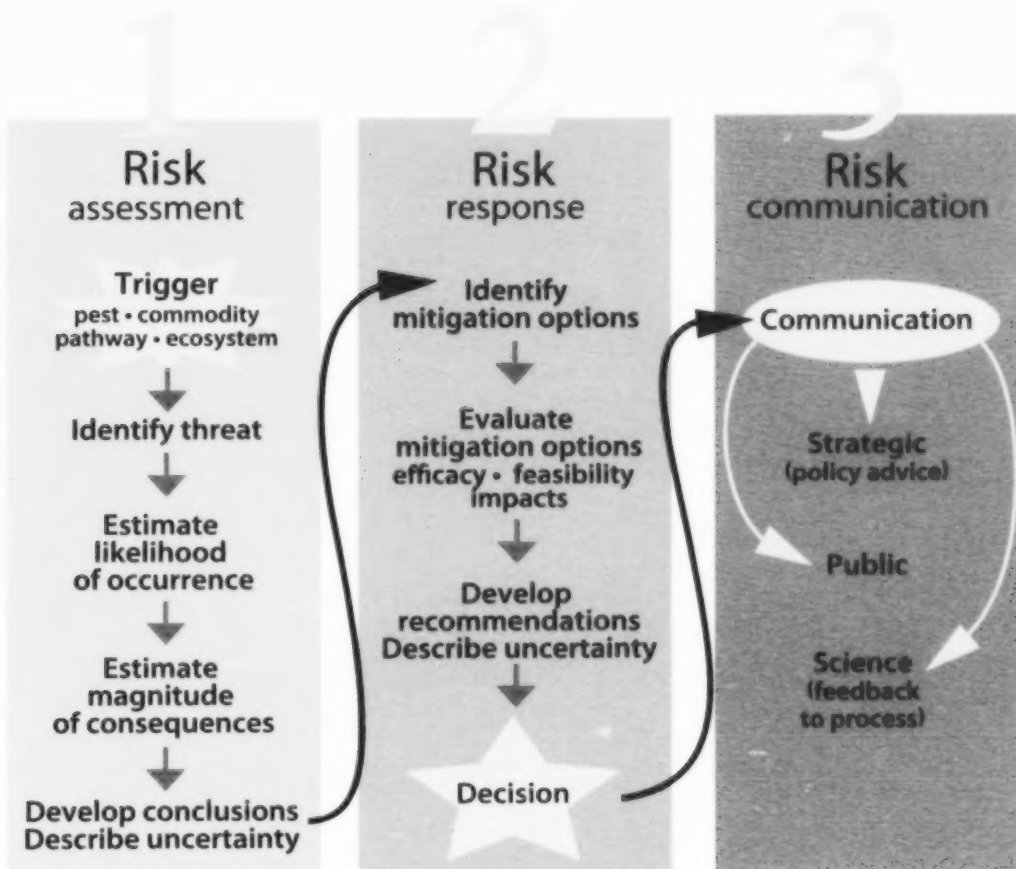
warrant control measures, considers options and determines the appropriate action to manage risk. Risk communication establishes interactive dialogue with stakeholders to provide open and consultative decisions that are effective and clear.

The framework ensures pest management decisions are based on the best available evidence and science.

It also ensures decisions take into account entire ecosystems—a requirement that moves the process from managing specific pests to comprehensive, long-term management of all pest-related threats to a forest ecosystem.

"One of the Canadian Council of Forest Ministers' goals with the strategy is to move us all away from reactive and regional pest management, towards making pest management decisions that are geared towards stopping problems from developing," Wood says. "The ecosystem approach is a driver of the National Forest Pest Strategy."

Based on the international plant-protection standards advocated by the International Plant Protection Convention, the risk analysis framework that forms a key component of the National Forest Pest Strategy includes three main steps: risk assessment, risk response and risk communication.



Portal opens on invasive forest pest information

Natural Resources Canada recently launched the Forest Invasive Alien Species of Canada (FIAS) public web portal. The site provides easy public access to more than 700 historical documents and records pertaining to invasive forest pests in Canada, while allowing scientists and analysts access to valuable historical data about pests in Canada's forests.

By visiting the portal, you can access records of non-native forest pests and diseases found by the Forest Insect and Disease Survey (FIDS) in its annual surveys until 1995 and in its annual reports dating back to the

1900s. As well, the database contains specimen records from the Canadian Forest Service's insect, fungus and plant collections, as well as pest fact sheets, policies and regulations, and other information about forest invasive alien species in Canada.

Visit the FIAS portal at www.ravageursexotiques.gc.ca

Source

See *Information Forestry*, December 2007, for more information on FIAS and its database capabilities.

Under the new framework, pest managers could assess not only the threats of major pests but the risks of secondary pests that move in after an outbreak, of root rot affecting regenerating stands, of hydrology and drought, and all the other ecosystem processes and factors that pests can affect. "Instead of asking 'What are the risks of this disease?' we might ask, for example, 'What are the threats to the productivity of the boreal zone?'" Nealis says.

The risk analysis framework, which is based on international standards set out by the International Plant Protection Convention, requires evidence to be disclosed and assessed, and uncertainties estimated. From this, the most informed policy decisions can be made that take into consideration threats to individuals, and to public and private organizations, to society and the environment at the local to global levels.

"It means everybody's on the same page," says Nealis. "If you want to make a decision for other reasons—socio-economic reasons, political reasons, whatever—you may do that, but let's not confound those things, which are important, with the evidence and information that have been provided and disclosed about what the risks are to forests."

Identification of potential problems in an ecosystem before they develop will also help ensure responses are integrated across affected regions.

As Saskatchewan's Rory McIntosh says, "If we identify the risks well beforehand, we can take steps to address them before they blow up into really big, really costly problems. The theory is, the more you invest in preventing pest problems, the less effort and resources will be required to control those problems and mitigate their consequences later on."

Provincial, territorial and federal ministers approved the National Forest Pest Strategy in principle last fall, and pest managers must now provide a plan to implement it across the country.

A number of technical advisory groups composed of pest management experts from the provinces, the Canadian Food Inspection Agency, the Canadian Forest Service and industry are working to identify ways in which the strategy can be implemented quickly, collaboratively and cost-effectively. Each group is focusing on a specific aspect of implementation. These aspects include monitoring systems and diagnostics, application of the risk framework, science and technology collaboration and needs, information management, and reporting and outreach.

"Implementation is not about introducing new programs or projects, or even new funding," says Wood. "Instead, it means aligning resources within all the various jurisdictions to the strategy, and building full capacity for pest management across the country through harmonization and collaboration."

Although implementation may change how pest managers work, Wood says the strategy is more about adopting new tools and methods to do the same job better. "The strategy is already positively affecting how pests are handled in Canada: we've already used the risk analysis framework to evaluate the threats associated with mountain pine beetle moving into the boreal forest."

The Canadian Council of Forest Ministers will review the implementation plan this summer. Once it is approved, forest managers in all jurisdictions will begin putting the pest-risk analysis framework and other aspects of the strategy into effect on a gradual basis across the country.

People

Departures

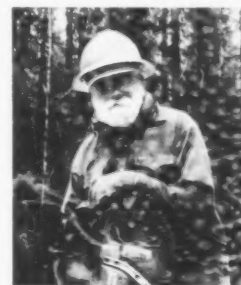
Sue Farlinger, Director General of the Pacific Forestry Centre, leaves the Canadian Forest Service in April to return to the Department of Fisheries and Oceans. During the 2.5 years Farlinger has been at the Pacific Forestry Centre, she has led Canadian Forest Service involvement in the National Forest Pest Strategy and the Federal Mountain Pine Beetle Program, and has participated in the realignment of Canadian Forest Service research and technology development programs to fit the organization's new mandate as a national science-based policy organization.

Also retiring from the Canadian Forest Service is Coordinator of Business Development and Marketing **Dean Mills**. Since 1982, Mills has liaised with scientists, research networks and others to develop collaborative programs and provide technology transfer tools and market information. He helped develop and implement a number of cooperative forestry agreements, including the Forest Resource Development Agreements (FRDA I and II), the Sustainable Forestry Development Program, the Yukon Forestry Development Agreement (1991–1996), and the South Moresby Forest Replacement Account.



Pacific Forestry Centre Director General Sue Farlinger during a United Way car-wash fund raiser

Entomology Technician **Doug Linton** retires from the Canadian Forest Service this spring. For more than 31 years, Linton has provided technical support in the Pacific Forestry Centre's bark beetle lab, helping Research Scientists Allan Carroll and Les Safranyik investigate beetle biology and the effects of forest practices on beetles. Before that, he worked as a silviculture technician and an insect pathology technician for the Canadian Forest Service.



Doug Linton

Events

Challenging times, winning strategies

PricewaterhouseCoopers 21st Annual Global Forest and Paper Industry Conference
May 8, 2008
Vancouver, BC

Information: <http://www.pwc.com/extweb/nccevents.nsf/docid/03BB9DD2B9A98769852573A900682355>

Climate for Change: Future of Opportunity

Council of Forest Industries (COFI) AGM
April 16–18, 2008
Kelowna, BC
Information: www.cofi.org

2008 British Columbia Community Forests Association Conference and AGM

May 30–June 1, 2008
Sechelt, BC
Information: <http://www.bccfa.ca/>

International Model Forest Network Global Forum

June 16–20, 2008
Hinton, Alberta
Information: <http://imfnglobalforum2008.blogspot.com/>

Biodiversity in Forest Ecosystems and Landscapes

International Union of Forest Research Organizations Conference
August 5–8, 2008
Kamloops, BC
Information: www.tru.ca/iufro.html

Adaptation, Breeding and Conservation in the Era of Forest Tree Genomics and Environmental Change

IUFRO–Canadian Tree Improvement Association 2008 Joint Meeting
August 25–28, 2008
Quebec City, Quebec
Information: <http://www.iufro-ctia2008.ca/>

Canada's Forest: Manage for Change

CIF/IFC 100th National Annual General Meeting and 2008 National Forestry Conference
September 7–10, 2008
Fredericton, New Brunswick
Information: www.cif-ifc.org/en/CIF_AGM2008

Entomological Society of Canada 58th Annual General Meeting

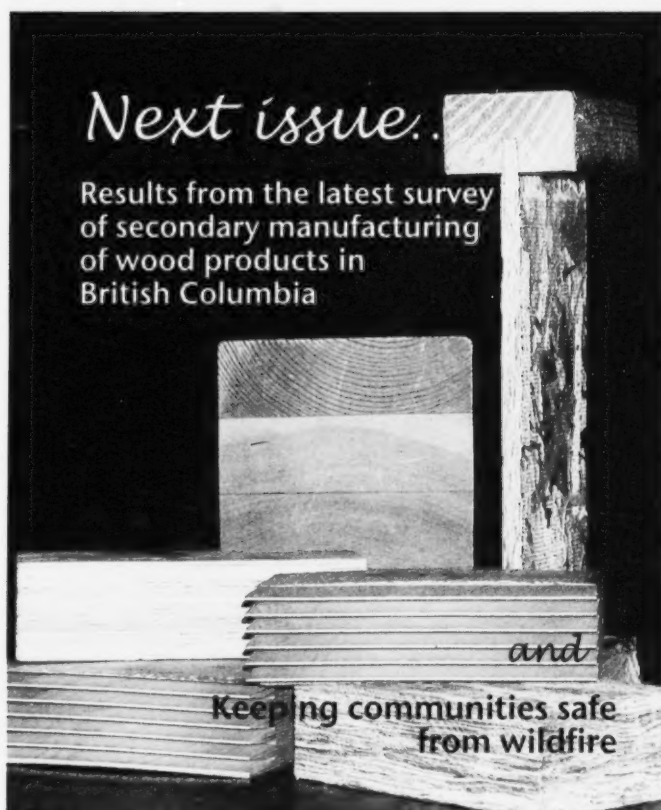
Joint Meeting with the Entomological Society of Ontario
October 18–22, 2008
Ottawa, Ontario
Information: www.esc-sec.org

New from the bookstore

BC-X information reports

Information-need-driven applications of remotely sensed data for mapping mountain pine beetle infestation at landscape and tree levels. 2007. Wulder, M.; White, J.C.; Coops, N.C. Information Report BC-X-410.

Canada's Boreal Forest Economy: economic and socio-economic issues and research opportunities. 2008. Bogdanski, Bryan E.C. Information Report BC-X-414.



An examination of the threats and risks to forests arising from invasive alien species. 2008. Krcmar, E. Information Report BC-X-415.

Mountain Pine Beetle working papers

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